

WHAT IS CLAIMED IS:

1. An isolated CLASP-2 polynucleotide, wherein said polynucleotide is
 - (a) a polynucleotide that has the sequence of SEQ ID NO: 1, 3, 5 or 9; or
 - (b) a polynucleotide that hybridizes under stringent hybridization conditions to
 - (a) and encodes a polypeptide having the sequence of SEQ ID NO: 2, 4, 6 or 10 or an allelic variant or homologue of a polypeptide having the sequence of SEQ ID NO: 2, 4, 6 or 10; or
 - (c) a polynucleotide that hybridizes under stringent hybridization conditions to
 - (a) and encodes a polypeptide with at 25 contiguous residues of the polypeptide of SEQ ID NO: 2, 4, 6 or 10; or
 - (d) a polynucleotide that hybridizes under stringent hybridization conditions to
 - (a) and has at least 12 contiguous bases identical to or exactly complementary to SEQ ID NO: 1, 3, 5 or 9.
 2. The polynucleotide of claim 1, wherein said polypeptide specifically binds to a PDZ domain of PSD95, DLG1 or neDLG.
 3. The polynucleotide of claim 2, wherein said polypeptide has a binding affinity of at least 10^4 M^{-1} for binding PSD95, DLG1 or neDLG.
 4. The polynucleotide of claim 1 that encodes a polypeptide having the full-length sequence of SEQ ID NO: 2, 4, 6 or 10.
 5. The isolated polynucleotide of claim 1, comprising the cDNA coding sequence of ATCC Deposit Nos. PTA-1562 and PTA-1563 and PTA-1573.
 6. An isolated CLASP-2 polynucleotide comprising a nucleotide sequence that has at least 90% percent identity to SEQ ID NO: 1, 3, 5 or 9.
 7. An isolated polypeptide comprising a nucleotide sequence that has at least 90% sequence identity to SEQ ID NO: 2, 4, 6 or 10 and is immunologically crossreactive with SEQ ID NO: 2, 4, 6 or 10 or shares a biological function with native CLASP-2.
 8. A vector comprising the polynucleotide of claim 1.

- 1 9. An expression vector comprising the polynucleotide of claim 1 in
2 which the nucleotide sequence of the polynucleotide is operatively linked with a regulatory
3 sequence that controls expression of the polynucleotide in a host cell.
- 1 10. A host cell comprising the polynucleotide of claim 1, or progeny of the
2 cell.
- 1 11. A host cell comprising the polynucleotide of claim 1, wherein the
2 nucleotide sequence of the polynucleotide is operatively linked with a regulatory sequence
3 that controls expression of the polynucleotide in a host cell, or progeny of the cell.
- 1 12. The host cell of claim 10 which is a eukaryote.
- 1 13. The polynucleotide of claim 1 that is an antisense polynucleotide less
2 than about 200 bases in length.
- 1 14. An antisense oligonucleotide complementary to a messenger RNA
2 comprising SEQ ID NO: 1, 3, 5 or 9 and encoding CLASP-2, wherein the oligonucleotide
3 inhibits the expression of CLASP-2.
- 1 15. An isolated DNA that encodes a CLASP-2 protein as shown in SEQ ID
2 NO: 2, 4, 6 or 10.
- 1 16. The polynucleotide of claim 1 that is RNA.
- 1 17. A method for producing a polypeptide comprising:
2 (a) culturing the host cell of claim 10 under conditions such that the
3 polypeptide is expressed; and
4 (b) recovering the polypeptide from the cultured host cell or its cultured
5 medium.
- 1 18. An isolated polypeptide encoded by a polynucleotide of claim 1 (a) or
2 (b).
- 1 19. The polypeptide of claim 18 that has the amino acid sequence of SEQ
2 ID NO: 2, 4, 6 or 10, or a fragment thereof.

1 20. The isolated polypeptide of claim 18, wherein the polypeptide is cell-
2 membrane associated.

1 21. The isolated polypeptide of claim 18, wherein the polypeptide is
2 soluble.

1 22. The polypeptide of claim 19, wherein the polypeptide is fused with a
2 heterologous polypeptide.

1 23. An isolated CLASP-2 protein having the sequence as shown in SEQ
2 ID NO: 2, 4, 6 or 10.

1 24. A protein comprising the sequence as shown in SEQ. ID. NO: 1 and
2 variants thereof that are at least 95% identical to SEQ ID. NO: 2 and specifically binds
3 spectrin.

1 25. An isolated antibody that specifically binds to a polypeptide having the
2 amino acid sequence as shown in SEQ ID NO: 2, 4, 6 or 10, or a binding fragment thereof.

1 26. The antibody of claim 25, that is monoclonal.

1 27. A hybridoma capable of secreting the antibody of claim 26

1 28. A method for identifying a compound or agent that binds a CLASP-2
2 polypeptide comprising:

3 i) contacting a CLASP-2 polypeptide of claim 19 with the compound or agent
4 under conditions which allow binding of the compound to the CLASP-2 polypeptide to form
5 a complex and

6 ii) detecting the presence of the complex.

1 29. A method of detecting a CLASP-2 polypeptide in a sample,
2 comprising:

3 (a) contacting the sample with an antibody or binding fragment of claim 26
4 and (b) determining whether a complex has been formed between the antibody and with
5 CLASP-2 polypeptide.

- 1 30. A method of detecting a CLASP-2 polypeptide in a sample,
2 comprising:
3 (a) contacting the sample with a polynucleotide of claim 1 or a polynucleotide
4 that comprises a sequence of at least 12 nucleotides and is complementary to a contiguous
5 sequence of the polynucleotide of section (a) of claim 1, and (b) determining whether a
6 hybridization complex has been formed.
- 1 31. A method of detecting a CLASP-2 nucleotide in a sample, comprising:
2 (a) using a polynucleotide that comprises a sequence of at least 12 nucleotides
3 and is complementary to a contiguous sequence of the polynucleotide of section (a) of claim
4 1, in an amplification process; and
5 (b) determining whether a specific amplification product has been formed.
- 1 32. A pharmaceutical composition comprising a polynucleotide of claim 1,
2 a polypeptide of claim 18, or an antibody of claim 25 and a pharmaceutically acceptable
3 carrier.
- 1 33. A method of inhibiting an immune response in a subject comprising:
2 (a) interfering with the expression of a CLASP-2 gene;
3 (b) interfering with the ability of a CLASP-2 protein to bind to another cell;
4 (c) interfering with the ability of a CLASP-2 protein to bind to another protein.
- 1 34. The method of claim 33, wherein the cell is a T cell or a B cell.
- 1 35. The method of claim 33 comprising contacting the cell with an
2 effective amount of a polypeptide which comprises the amino acid sequence of SEQ ID NO:
3 2, 4, 6 or 10 or a fragment thereof.
- 1 36. A method of inhibiting an immune response in a subject, comprising
2 administering to the subject a therapeutically effective amount of an antibody which
3 specifically binds a polypeptide having the sequence of SEQ ID NO: 2, 4, 6 or 10.

1 37. A method of preventing or treating a CLASP-2-mediated disease
2 comprising administering to a subject in need thereof a therapeutically effective amount of a
3 pharmaceutical composition of claim 32.

1 38. The method claim 37, wherein the CLASP-2-mediated disease is an
2 autoimmune disease.

1 39. A method of treating an autoimmune disease in a subject caused or
2 exacerbated by increased activity of T_H1 cells consisting of administering a therapeutically
3 effective amount of a pharmaceutical composition of claim 32 to the subject.

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